

1 **(March 13, 1995)**

2 **Shotcrete Application**

3 A clean, dry supply of compressed air sufficient for maintaining adequate nozzle
4 velocity for all parts for the work and for simultaneous operation of a blow pipe for
5 cleaning away rebound shall be maintained at all times. Thickness, method of
6 support, air pressure, and rate of placement of shotcrete shall be controlled to
7 prevent sagging or sloughing of freshly-applied shotcrete.

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9 The shotcrete shall be applied from the lower part of the area upwards. Surfaces
10 to be shot shall be damp, but free of standing water.

11
12 The nozzles shall be held at an angle approximately perpendicular to the working
13 face and at a distance that will keep rebound at a minimum and compaction will
14 be maximized. Shotcrete shall emerge from the nozzle in a steady uninterrupted
15 flow. If, for any reason, the flow becomes intermittent, the nozzle shall be diverted
16 from the work until a steady flow resumes.

17
18 Surface defects shall be repaired as soon as possible after initial placement of the
19 shotcrete. All shotcrete which lacks uniformity; which exhibits segregation,
20 honeycombing, or lamination; or which contains any dry patches, slugs, voids, or
21 sand pockets, shall be removed and replaced with fresh shotcrete by the
22 Contractor, to the satisfaction of the Engineer at no cost to the Contracting
23 Agency.

24
25 Construction joints in the shotcrete shall be uniformly tapered over a minimum
26 distance of twice the thickness of the shotcrete layer. The surface of the joints
27 shall be cleaned and thoroughly wetted before adjacent shotcreting is performed.
28 Shotcrete shall be placed in a manner which provides a finish with uniform texture
29 and color across the construction joint.

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31 The shotcrete shall be cured by applying a clear curing compound in accordance
32 with Section 9-23.2. The curing compound shall be applied immediately after final
33 gunning. The air in contact with shotcrete surfaces shall be maintained at
34 temperatures above 40 F for a minimum of 7 days. Curing compounds shall not
35 be used on any surfaces against which additional shotcrete or other cementitious
36 finishing materials are to be bonded unless positive measures such as
37 sandblasting, are taken to completely remove the curing compounds prior to the
38 application of such additional materials.

39
40 If field inspection or testing, by the Engineer, indicates that any shotcrete
41 produced, fails to meet the requirements, the Contractor shall immediately modify
42 procedures, equipment, or system, as necessary, and as approved by the
43 Engineer to produce specification material. All substandard shotcrete already
44 placed shall be repaired by the Contractor, to the satisfaction of the Engineer, at
45 no cost to the Contracting Agency. Such repairs may include removal and
46 replacement of all affected materials.